

User Guide



Wireless N Range Extender



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Chapter 1 Product Overview

The Tenda AP is a Wireless N Range Extender which is designed to extend the coverage and improve the signal strength of an existing wireless network using either AP mode or WDS mode. Combined with leading wireless N technologies, superior security (WEP, WPA-PSK, WPA2-PSK, WPA-PSK&WPA2-PSK, MAC-based wireless client access control) and backward compatibility with wireless b/g, the Tenda AP makes it a secure high speed solution that vastly improves your network coverage without changing existing wireless network, giving you the freedom to roam anywhere in the house and access Internet without worrying about coverage. Plus, the world's most intuitive user interface lets you, even a novice, configure the AP in a few seconds without any network know-how required. It is the best solution for home, dorm and SOHO environment.

1.1 Package Contents

Please unpack the box and check the following items:

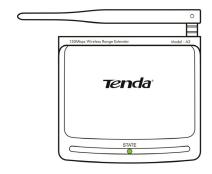
- Wireless AP
- Power Adapter
- Ouick Installation Guide
- CD-ROM

If any of the above items are incorrect, missing, or damaged, please contact your Tenda reseller for immediate replacement.



1.2 Panel Overview

LED overview (Take A3 as an example):



LED	Status	Description
STATE	Blinking	System is functioning properly

Port/Button Overview: (A3 is used in the figure below):



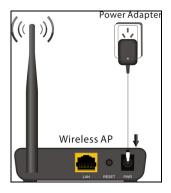


Port/Button	Port/Button Description	
LAN	For connection to a computer or router.	
RESET	Pressing this button for 7 seconds restores the device to factory default settings.	
PWR	Power receptor. Do not use a different power adapter than the included one.	

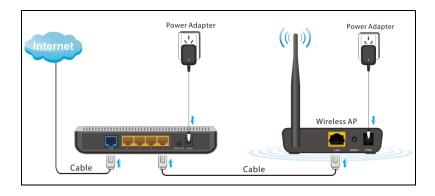


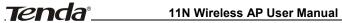
Chapter 2 Installation

1. Connect one end of the included power adapter to the AP and then plug the other end into a wall outlet nearby. (Using a power supply with a different voltage rating than the one included with the AP will cause damage to the product.)

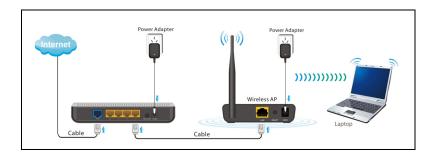


2. Connect the LAN port on your AP to one of the LAN ports on a wired router using an Ethernet cable.





.3. Connect your PC to the AP wirelessly.





Chapter 3 Setup

3.1 Connecting to AP Wirelessly

3.1.1 In Windows XP

1. Right click "My Network Places" and select "Properties".

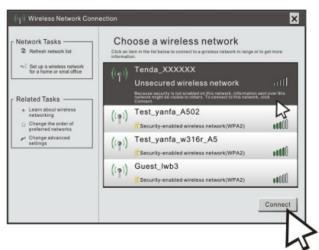


2. Right click "Wireless Network Connection" and select "View Available Wireless Networks".

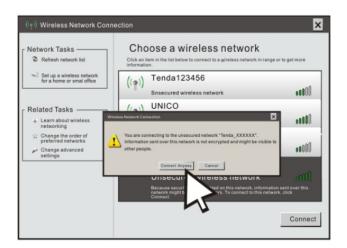




3. Select the AP's SSID.



4. Click "Connect Anyway".



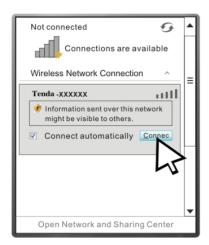


3.1.2 In Windows 7

1. Click network icon desktop.



2. Select AP's SSID and click "Connect".



3. You have successfully connected your PC to the AP wirelessly



when you see "Connected" next to the AP's SSID.



4. Choose your network location.





3.2 Login to AP

1. Open a web browser, enter http:// 192.168.0.254 in the address bar and then press "Enter" to go to interface below:



3.3 Quick Encryption

Use the interface below to fast secure your wireless network (Only a catchy security key is required) or go to Advanced (click the "Advanced" tab on the upper right corner)—Wireless—Basic Settings for more settings (Apart from the security key option, you can select a security mode and a cipher type that best fit yourself or keep the defaults thereof unchanged. Detailed settings for this latter option refer to Section 5.2 hereof).

The interface below allows you to setup a wireless password (security key) that consists of 8 characters only. The password is preset to 12345678 by default; you can change it to whatever catchy phrase of 8 characters only.



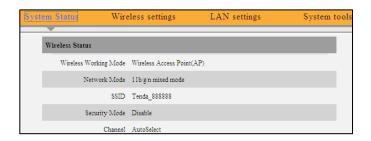
Advanced Settings Advanced Settings				
Wireless encryption				
Wireless password: 12345678	(Initial password: 12345678)			
For other access methods ,click "Advanced Settings"				
Ok Cancel				



Chapter 4 System Status

This section allows you to view the AP's information.

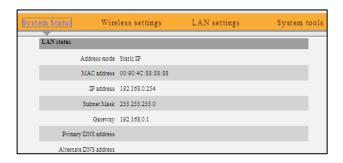
4.1 Wireless



- Wireless Working Mode: Displays AP's current working mode: AP or WDS mode.
- ◆ **Network Mode:** Displays AP's current IEEE802.11 mode: 11n/g/b.
- ♦ **SSID:** Displays AP's current wireless network name.
- ◆ **Security Mode:** Displays AP's current wireless security mode.
- ◆ **Channel:** Displays AP's current wireless channel.



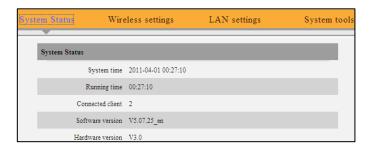
4.2 LAN



- ◆ Address Mode: Displays AP's current IP mode: Dynamic IP or Static IP.
- ◆ MAC Address: Displays AP's LAN MAC address.
- ◆ **IP Address:** Displays AP's current IP address.
- ♦ **Subnet Mask:** Displays AP's current IP subnet mask.
- ◆ **Gateway:** Displays AP's current gateway address.



4.3 System Status

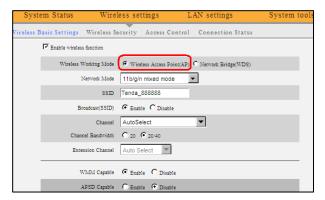


- System Time: Displays the time customized by you or obtained from Internet.
- Running Time: Displays device's up time.
- ◆ **Connected client**: Displays the number of connected computers.
- ♦ **Software Version:** Displays router's firmware version.
- ♦ Hardware Version: Displays router's hardware version.



Chapter 5 Wireless Settings

5.1 Basic Settings



- ◆ Enable Wireless Functions: Check/uncheck to enable/disable the wireless feature. When unchecked, all wireless related features will be disabled.
- Wireless Working Mode: Select either AP or WDS according to your practical needs.
- ◆ AP mode:To simply convert your existing wired network to a wireless network that allows flexible mobility for LAN access, select this AP mode.
- ◆ Network Mode: Select a right IEEE802.11 mode from the following according to your wireless client. The default mode is 11b/g/n mixed.
- ◆ **11b mode:** Select it if you have only Wireless-B clients in your wireless network.



- ◆ 11g mode: Select it if you have only Wireless-G clients in your wireless network.
- ◆ 11b/g mixed mode: Select it if you have only Wireless-B and Wireless-G clients in your wireless network.
- ◆ 11b/g/n mixed mode: Select it if you have Wireless-B, Wireless-G and Wireless-N clients in your wireless network.
- Broadcast (SSID): If you select "Disable", no wireless clients will be able to see your wireless network when they perform a scan to see what's available. If they want to connect to your AP, they will have to first know this SSID and then manually enter it on their devices. By default, this option is enabled.
- ◆ Channel: The Channel can be changed to fit the channel setting for an existing wireless network or to customize the wireless network. From the drop-down list, you can select a most effective channel, which ranges from 1 to 11. You can also select "Auto Select" to let system detect and choose one that best fits your network.
- ◆ WMM-Capable: Enabling this option may boost transmission capacity of wireless multimedia data (such as online video play). For better wireless performance, you are recommended to enable this option.
- ◆ **ASPD Capable:** Auto power saving mode, disabled by default.
- ◆ Channel Bandwidth: Select a proper channel bandwidth to enhance wireless performance. Select 20/40M, if there are 11b/g and 11n wireless clients; select 20M, if there are only non-11n wireless clients.
 - when the wireless network mode is 11n mode, please select

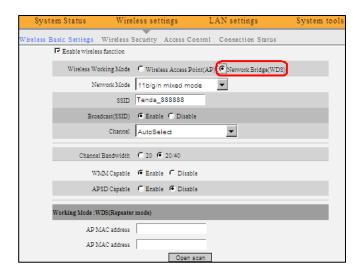


20/40 frequency band to boost its throughput.

♦ **Extension Channel:** Working frequency range for 11n mode.

WDS Mode:

To extend your existing wireless network coverage, select the WDS (Wireless Distribution System) feature.



◆ AP MAC Address: Enter the MAC address of a wireless link partner or populate

this field using the Open Scan option.

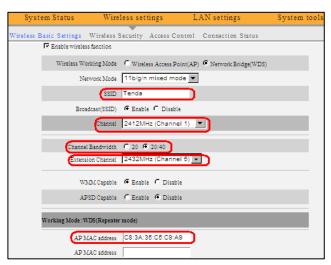
Application example: Implement the WDS feature using Tenda products of A3 (Wireless AP) and W316R (Wireless Router).

1. Change the default wireless working mode of AP on A3 to WDS as shown in the figure below:



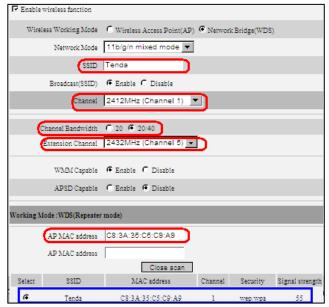


- 2. Add W316R's MAC address to A3 and change A3's SSID and channel respectively to those of W316R.
- a. If you already know W316R's MAC address, SSID and channel settings, then you can manually configure the same settings on A3.



- b. Or you can use the Open Scan option.
- 1) Click the "Open Scan" button to display a list of available wireless networks, select the W316R's SSID from the list and click OK on the appearing dialogue box; W316R's MAC address, SSID and channel settings will be automatically added to the A3.





- 2. Click OK to save your settings.
- 3. Configure wireless security settings. For this step, refer to section 5.2 hereof.
- 4. Repeat steps 1-3 on W316R.

Note: SSID, channel, security settings and security key must be the same on both A3 and W316R for successful WDS implementation.

⚠Note:

1. WDS feature can be implemented only between 2 wireless devices that both support the WDS feature. Plus, SSID, channel, security settings and security key must be the same on both devices. Using the Open Scan option and selecting link partner from the scan list automatically change the AP's existing SSID and channel settings



respectively to those of link partner as well as add link partner's MAC address. So we recommend you to use this Open Scan option for easy WDS settings.

Using WEP encryption improves WDS compatibility. For this reason, we recommend you to encrypt your wireless network with WEP when using the WDS feature.

5.2 Wireless Security

This section allows you to configure wireless encryption to block unauthorized access to your wireless network and prevent malicious packet sniffing. 3 ways are provided to encrypt your data: WEP, WPA-PSK and WPA2-PSK.

5.2.1 WEP

WEP (Wired Equivalent Privacy) is intended to provide data confidentiality comparable to that of a traditional wired network. It has super compatibility. Try to use this encryption if you are coming across a failure when implementing WDS with a wireless device of a different chip.



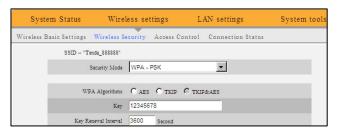


◆ Default Key: Select one key from the 4 preset keys.

You can either select ASCII, which allows 5 or 13 characters, or hexadecimal, which allows 10 or 26 characters for WEP key format.

5.2.2 WPA-PSK

The WPA protocol implements the majority of the IEEE 802.11i standard. It enhances data encryption through the Temporal Key Integrity Protocol (TKIP) which is a 128-bit per-packet key, meaning that it dynamically generates a new key for each packet. WPA also includes a message integrity check feature to prevent data packets from being hampered with. Only authorized network users can access the wireless network.



- ◆ **WPA Algorithms:** Select either AES (advanced encryption standard) or TKIP (temporary key integrity protocol) type.
- ◆ **Key:** Enter a security key, which must be between 8-63 ASCII characters.
- ◆ Key Renewal Interval: Set a valid period for the security key.



5.2.3 WPA2-PSK

The later WPA2 protocol features compliance with the full IEEE 802.11i standard and uses Advanced Encryption Standard (AES) in addition to TKIP encryption protocol to guarantee better security than that provided by WEP or WPA.

⚠_{Note:}

According to latest WIFI standards,

- a. When WEP or TKIP is selected, network mode will change to "11b/g mixed" automatically.
- b. When AES or TKIP&AES is selected, network mode will change to "11b/g/n mixed" automatically.

5.3 MAC-based Wireless Access Control

The MAC-based Wireless Access Control feature can be used to allow or disallow clients to connect to your wireless network.



MAC Address Filter: "Permit" means to permit PCs at specified MAC addresses to connect to your wireless network while "Forbid" means to block only PCs at specified MAC addresses from connecting to your wireless network.



- ◆ MAC Address: Enter the MAC addresses of a wireless client and click "Add".
- MAC Address List: Displays the MAC addresses added by you. You can delete any entry by clicking on the "Delete" button next to it.

Example 1:

To allow only the PC at a MAC address of 00:e8:c8:a4:56:75 to connect to your wireless network, do as follows:

Step1. Select "Permit" from MAC Address Filter drop-down menu.

Step2. Enter 00:e8:c8:a4:56:75 in the MAC address box.

Step3. Click the "OK" button to save your settings and you can add more MAC addresses, if you like, simply repeating the above steps.

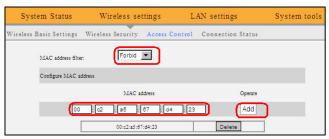


Example 2:

To prohibit only the PC at a MAC address of 00:c2:a5:67:d4:23 from connecting to your wireless network, do as follows:

- 1. Select "Forbid" from MAC Address Filter drop-down menu.
- 2. Repeat steps 2-3 in example 1 above.





5.4 Connection Status

This interface displays the information of currently connected wireless clients including MAC addresses and bandwidth.



- ◆ MAC Address: Displays the MAC addresses of the PCs that have been wirelessly connected to your AP
- ◆ **Bandwidth:** Displays the channel bandwidth used by the currently connected hosts (connected wireless clients).

△Note:

"Bandwidth" refers to the wireless channel bandwidth instead of wireless connection rate.



Chapter 6 LAN Settings

Click "LAN Settings" to enter the interface below. The AP's LAN IP can either be static or dynamic.

6.1 Static IP



- ◆ MAC Address: Displays the AP's LAN MAC address, which cannot be changed.
- ◆ Address Mode: Select either static or dynamic IP.
- ◆ IP Address: The default LAN IP address for this AP is 192.168.0.254. You can change it according to your need.
- ◆ **Subnet Mask:** Enter the AP's LAN subnet mask. The default value is 255.255.255.0.
- ◆ Gateway: Enter a connected router's IP address.
- Primary DNS Address: Enter the DNS address provided by your ISP or a connected router's IP address.
- Alternate DNS Address: Enter the secondary DNS address if your ISP provides, and it is optional.



6.2 Dynamic IP (DHCP)

Select this option only if you have a DHCP-enabled router on your network to assign an IP address to your AP. Otherwise use the static IP option.



△Note:

- If you change the device' LAN IP address, you have to enter the new one in your browser to get back into the web-based configuration utility.
- 2. If you are using the dynamic IP option, you need to first go to the management interface of the DHCP-enabled router (where your AP obtains IP) to check your AP's IP address and then use this IP to log in to your AP's management interface. So, do not use this option unless you have authorized access to the router to check your AP's IP address therein or you don't need to go to AP's management interface to configure any settings.



Chapter 7 Tools

7.1 Time Settings

This section assists you in setting the device's system time; you can either select to set the time and date manually or automatically obtain the GMT time from Internet.



<u>Note:</u>

The configured time information loses once the device is powered off. But it obtains the GMT time automatically when you connect it to the Internet. Features/functions based on time (e.g. security settings) take effect only after Time and Date settings are configured manually or updated automatically from Internet.

7.2 Backup/Restore Settings

This section allows you to backup current settings or to restore the previous settings configured on the device.





◆ Backup Settings: Once you have configured the device the way you want it, you can save these settings to a configuration file on your local hard drive that can later be imported to your device in case that the deivce is restored to factory default settings. To do this, click the "Backup" button next to where it says "Select the file directory to save the configured parameters" on the screen above.



And then, click the "Save" button on the appearing screen above to store it under the selected path.

◆ Restore Settings: Click the "Browse" button to locate and select a configuration file that is saved previously to your local



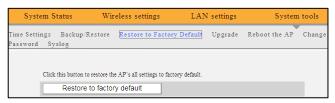
hard drive.



And then click the "Restore" button to reset your device to previous settings.'

7.3 Restore to Factory Default Settings

To restore all settings to the device's factory default values, click the "Restore to Factory Default" button on the interface below:



Factory Default Settings:

◆ **Password:** There is no preset password by default.

◆ IP Address: 192.168.0. 254◆ Subnet Mask: 255.255.255.0

△Note:

To activate your settings, reboot the device after you reset it.



7.4 Firmware Upgrade

Firmware upgrade is released periodically to improve the functionality of your device and also to add new features. If you run into a problem with a specific feature of the device, log on to our website (www.tenda.cn) to download the latest firmware to update it.



- ◆ **Browse:** Click this button to select an upgrade file.
- ◆ **Upgrade:** Click this button to start an upgrading process. After the upgrade is completed, the device will reboot automatically.

⚠NOTE:

Do not disconnect the device from your management PC (the PC you use to configure the device) or power off it during the upgrade process; otherwise, it may be permanently damaged. The devoce will restart automatically when the upgrade process, which takes several minutes, completes.

7.5 AP Reboot

By Rebooting the device, new settings can be brought into effect.

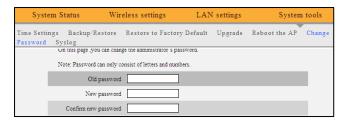


And LAN connection will be cut automatically during this process.



7.6 Change Password

On the screen below, you can change the password for login to the device's Web-based interface.



- ◆ **Old Password:** Enter the old password. (If you have not changed the login password before, then just leave this field blank, for there is no preset password by default.)
- ◆ **New Password:** Enter a new password.
- ◆ Confirm new Password: Re-enter the new password for confirmation.

If you enter a correct old password, then clicking the "OK" button saves your new password.

⚠NOTE:

For the purpose of security, it is highly recommended that you



change default login password.

7.7 SysLog

The Syslog option allows you to view all events that occur upon system startup and check whether there is attack on your network.



Refresh: Click this button to update the log.

◆ Clear: Click this button to clear the log record.



Appendix 1: Glossary

Channel

A communication channel, also known as channel, refers either to a physical transmission medium such as a wire or to a logical connection over a multiplexed medium such as a radio channel. It is used to transfer an information signal, such as a digital bit stream, from one or more transmitters to one or more receivers. If there are several APs coexisting in the same area, it is recommended that you configure a different channel for each AP to minimize the interference between neighboring APs. For example, if 3 American- standard APs (i.e. adopts channel 11) coexist in one area, you can setup their channels respectively to 1, 6 and 11 to avoid mutual interference.

SSID

Service set identifier (SSID) is used to identify a particular 802.11 wireless LAN. It is the name of a specific wireless network. To let your wireless network adapter roam among different APs, you must set all Aps' SSID to the same name.

WPA/WPA2

The WPA protocol implements the majority of the IEEE 802.11i standard. It enhances data encryption through the Temporal Key Integrity Protocol (TKIP) which is a 128-bit per-packet key, meaning that it dynamically generates a new key for each packet. WPA also includes a message integrity check feature to prevent data packets from being hampered with. Only authorized network



users can access the wireless network.

The later WPA2 protocol features compliance with the full IEEE 802.11i standard and uses Advanced Encryption Standard (AES) in addition to TKIP encryption protocol to guarantee better security than that provided by WEP or WPA.



Appendix 2: Features

- Compliant with IEEE802.11n/g/b, IEEE802.3/3u \triangleright
- Wireless speed up to 300Mbps/150Mbps \triangleright
- Supports Wi-Fi Multimedia (WMM) to smooth video and audio
- High gain antenna(s) for better coverage \triangleright
- Supports WEP/WPA-PSK/WPA2-PSK encryptions \triangleright
- Supports WDS to seamlessly expand your wireless network
- Supports hidden SSID broadcast for better security \triangleright
- Syslog records AP's usage status \triangleright
- 1* 10/100M auto-negotiation Ethernet port
- \triangleright MAC-based wireless access control
- Supports SNTP, auto MID/MDIX. \triangleright



Appendix 3: Troubleshooting

1. Q: I can't log in to AP's web-based management interface after entering 192.168.0.254 in the browser's address bar, what should I do?

- A: 1). Verify that your PC's IP address is set to any value between 192.168.0.2-192.168.0.253.
- 2). Try a different browser or delete your existing browser's cache and cookies. Make sure your browser's connection mode is "Never dial a connection".
- 3). Restart your PC if you are using Windows 98 OS and have changed your PC's IP address.
- 4). Verify that your wireless adapter is working correctly. Renew adapter's drive in presence of multiple connection failure.

2. Q: I forget the login password to my AP, what should I do?

A: In this case, you need to restore the AP to factory default settings. To do so, Press the hardware RESET on your AP for about 7 seconds and then release.

3. Q: My PC is unable to search AP's wireless network, what should I do?

- A: 1). Verify that wireless is enabled on your PC.
 - 2) . Make sure that AP is correctly powered.
 - 3). Remove any large metal objects in between your PC and AP.
- 4) . Clear any interference sources such as cordless telephones and microwave ovens, etc.



If you still have some problems, please contact our technical support.

Technical Support

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Appendix 4: Remove Wireless Network on Your PC

Changing wireless settings on AP while keeping them unchanged on your PC may lead to connection failure when trying connecting to the AP wirelessly. So, do remember to delete the wireless settings on your PC when you have changed them on the AP. Below presents you the way to do so.

In Windows XP

1. Right click "My Network Places" and select "Properties".

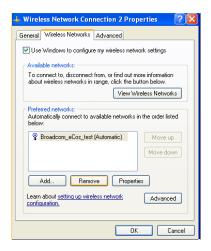


2. Click Wireless Network Connection and then select Properties.



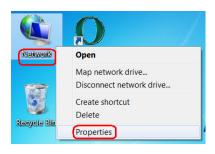


3. Click "Wireless Networks", select the item under "Preferred networks" and click the Remove button.



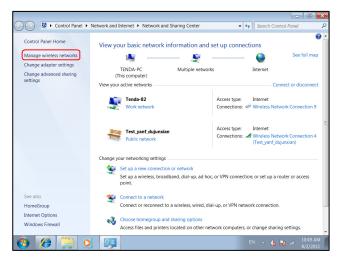
In Windows 7

1. Click network icor on your desktop and select Properties.

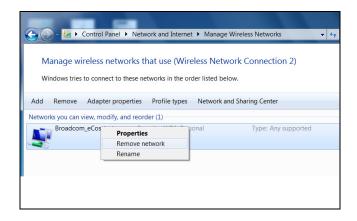


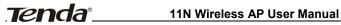


2. Select "Manage Wireless Networks".



3. Click the wireless connection and select "Remove network".





Appendix 5: Security Statement

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the may cause harmful interference instructions, to communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference

to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- -Reorient or relocate the receiving antenna.
- -Increase the separation between the equipment and receiver.
- -Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- -Consult the dealer or an experienced radio/TV technician for help. To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example- use only shielded interface cables when connecting to computer or peripheral devices).

"The antenna(s) used for this transmitter must not be co-located



or operating in conjunction with any other antenna or transmitter."

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with the minimum distance of 20 cm. Operation is subject to the following two conditions:

- 1) This device may not cause interference, and
- 2) This device must accept any interference, including interference that may cause undesired operation of the device.

Caution!

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user authority to operate the equipment.

Eu Declaration or Declaration of Conformity

Hereby, SHENZHEN TENDA TECHNOLOGY CO.,LTD, declares that this wireless device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.